

# MISSED A VITAL EMAIL? SHOULD HAVE GONE TO GOOGSAVERS

Mark Harris, one of the first outsiders to try out the tech giant's wearable computer, has seen the future: daft though the gadget looks, we will all soon be eyeing up Google Glass

Google Glass is a smartphone that you wear on your face. Why not Google Glasses? Because 'glass' is hipper, of course, and screams California cyberdude. The frames don't come with conventional lenses but with a miniature screen that will display stock prices, instant messages, tweets, news headlines — anything you might want to know delivered straight to your peripheral vision. The tech giant is banking on us wanting to be connected all the time, rather than having to fish the phone from your pocket and check the screen.

I was one of the first journalists to try the new device, and I believe it could introduce a revolution in behaviour. In the future, spectacles frames on a person's face will not signify myopia so much as vision — wearers will be the people in the know.

I tried out Glass at Google I/O, the company's annual conference for developers, in San Francisco last month. At the event, Larry Page, Google's co-founder, proclaimed: "Our main goal is to get people happy using Glass. [The] communication and navigation is amazing. Ultimately, a lot of your experiences can move to Glass."

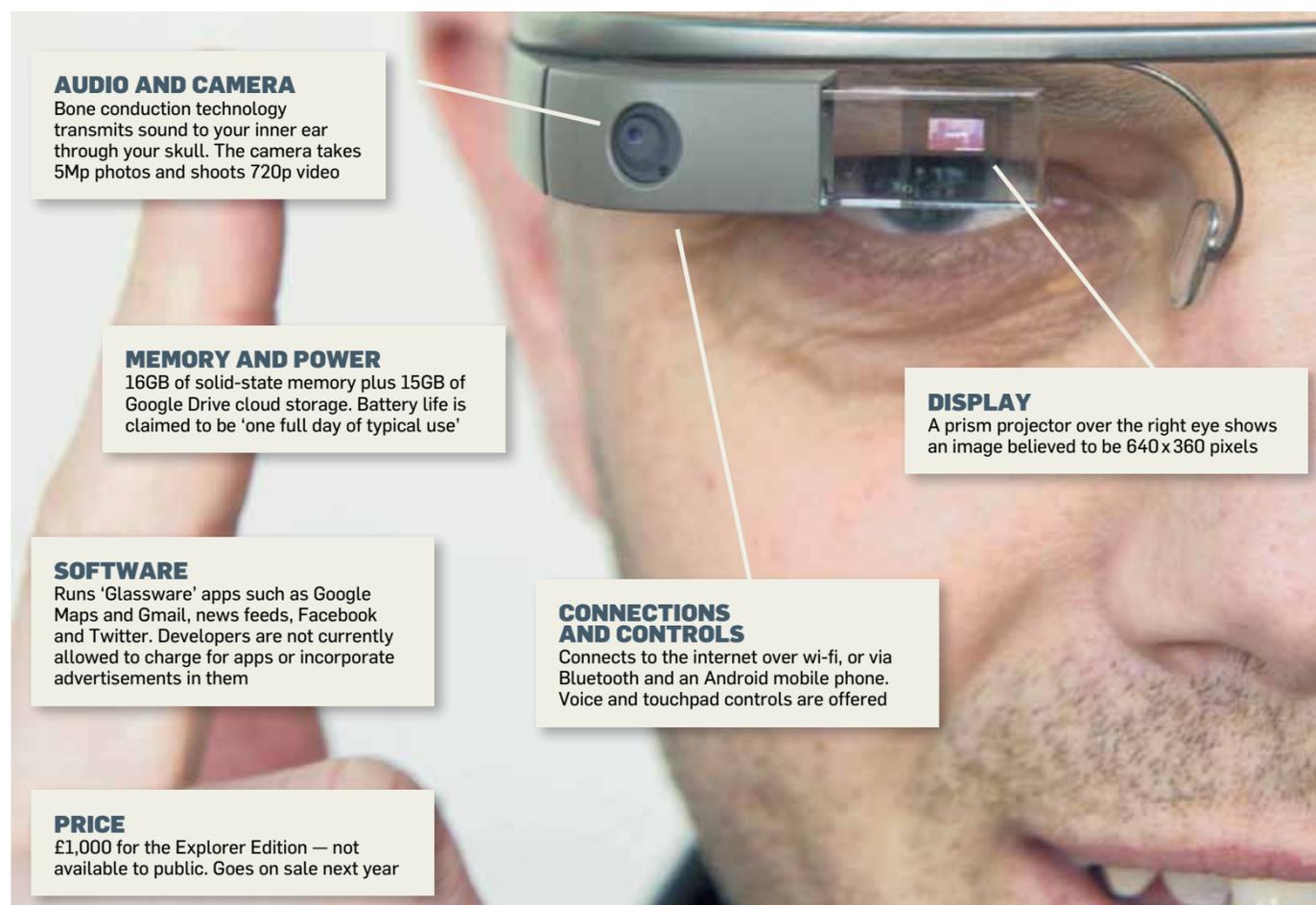
By which he probably meant his company has recognised that in the future we will all have an insatiable appetite for new information.

Connected to a network using its own wi-fi or a wireless Bluetooth link to an Android phone in your pocket, Glass can make voice and video calls, search the web, display weather forecasts or direct you to a destination. It can also take high-definition photos and video footage, and coming soon are apps that will identify the buildings around you, use face-recognition technology to tell you who you are speaking to, and should be able to pick out anyone — from celebrities to the FBI's most wanted — from a crowd.

A tiny head-up display acts as a screen, and the device is controlled by the wearer's voice or a touch-sensitive pad situated on one arm of the "spectacles".

The device I tested is a pre-production "Explorer Edition" version of Glass. Only 10,000 have been made and they cost \$1,500 (£1,000) each. They are not yet on sale to the general public, and the entire first batch went to Silicon Valley insiders and American developers writing apps for the gadget.

Of course the one place where Glass was easily found was



#### AUDIO AND CAMERA

Bone conduction technology transmits sound to your inner ear through your skull. The camera takes 5Mp photos and shoots 720p video

#### MEMORY AND POWER

16GB of solid-state memory plus 15GB of Google Drive cloud storage. Battery life is claimed to be 'one full day of typical use'

#### SOFTWARE

Runs 'Glassware' apps such as Google Maps and Gmail, news feeds, Facebook and Twitter. Developers are not currently allowed to charge for apps or incorporate advertisements in them

#### PRICE

£1,000 for the Explorer Edition — not available to public. Goes on sale next year

#### DISPLAY

A prism projector over the right eye shows an image believed to be 640x360 pixels

#### CONNECTIONS AND CONTROLS

Connects to the internet over wi-fi, or via Bluetooth and an Android mobile phone. Voice and touchpad controls are offered

Google's own conference venue. Many of the staff manning stands wore Glass, and were in fact forbidden from removing the devices for the duration of the show.

Conference guests were also happy to model the gadgets — one in 10 of them had got their hands on a pair — and were using them mostly to snap photos to post online, or to check their emails, or simply for the geeky enjoyment of having them.

I managed to persuade a developer to lend me a pair — and almost

Mark Harris gives Google Glass a gander at the company's I/O developers' conference in San Francisco

instantly committed my first digital faux pas. While fumbling with the frame I inadvertently hit the touch-sensitive camera control, and a second later an embarrassing image of a nearby woman's lower half appeared in the display.

Luckily, nobody else could see the photograph — in fact, nobody even knew I'd taken a shot, as Google Glass lacks the small LED warning light that on a camcorder, say, shows when you are recording footage. I swiftly deleted the photo.

Dr Astro Teller, head of Google X, the department that developed Google Glass and other futuristic projects such as the Google self-driving car, recently defended the technology against claims that the ability surreptitiously to take photos and videos of everything a person is looking at, or everyone they are talking to, could constitute an invasion of privacy.

"Convenience is what matters most," Teller said. "It takes me 10 or 20 seconds to get out my phone, so rather than think of [Glass] as distracting,

you can see [it] as having gained time."

Although Glass feels unbalanced in the hand because all the gadgetry is packed into a plastic housing on the right-hand side, it feels light and comfortable on the face, and little different from wearing a pair of expensive sunglasses.

Glass comes with attachable tinted lenses to turn them into just that, while a few Googlers at the conference

**'While fumbling with the device I took an embarrassing image of a nearby woman's lower half'**

had even fitted their devices with prescription lenses.

The biggest innovation is the head-up display in the upper right-hand corner. This has a prism that refracts light from a digital projector within the plastic housing. When the display is inactive it is virtually transparent, and when it is active, the image floats just above your field of view, requiring an upward glance to read it.

Google says its resolution of 640x360 pixels is the equivalent of a 25in HD television viewed from 8ft away. A better comparison would be viewing the screen of your mobile at arm's length — fine for glancing at a few lines of large-format text or a blurry image, but you wouldn't want to watch a film in this way.

There are three ways to control Glass. Tilting your head up wakes the device and activates the display, which shows you the time. If it is already switched on, the same motion turns it off. The touch panel at your temple lets you slide through menu options or wake up the gadget. But by far the



Voice commands let you shoot photos and video while your hands are full



Glass will overlay location and route information so you can find your way

## LOOKING FORWARD

By the time Glass enters full production there will be many more apps that use its speech recognition, camera and internet connectivity to the full. Google says it will not build facial recognition into the device, but that hasn't deterred independent developers. Technology from Lambda Labs will allow users to upload pictures of faces and have their Glass recognise people automatically in person. Another developer has made an app to control and beam back video from a drone helicopter, and games, fitness and even pornography apps are in the pipeline.

coolest way to interact with Glass is through voice commands, which must all start with "OK Glass". You can then ask it to take a picture, record a video, do a Google search, call a contact, get directions and more besides.

Searches generally show a few lines of text in the screen or are read aloud, as are incoming emails and texts. For basic queries Glass coped well with my English accent, but it struggled when I ventured further afield.

A web search for "Stockholm" was interpreted as a request for "F\*\*\* home" — a rather different proposition. This misunderstanding may have been down to the bustle of the conference, but the venue was no noisier than a city street.

No headphones are needed with Glass, as sound is transmitted clearly and discreetly through your skull by a "bone conduction transducer" and is clearly audible over the general hubbub. Navigation graphics for driving and walking directions look clear and simple — but a really sunny day could wash out the display.

There are other frustrations. The display is bright and colourful but not big or detailed enough to avoid you having to fish out your phone for a proper look at a website, email or video.

The two most convincing applications — head-up navigation and hands-free photos — are not something that most people would need every day or even every week. And even if the price of Google Glass halves by the time a consumer version appears next year, it will still be expensive, especially as it requires you to own an equally pricey top-end Android phone.

The Google conference did confirm one thing: there is no sign that self-consciousness or fear of looking stupid will deter from people wearing the specs. There were some funny moments, such as when people suddenly stopped walking and stared blankly into space as they read new emails, or jerked their head back to turn

the gadget on or off. But who would have thought, before the advent of mobile phone headsets and headphone cables with built-in microphones, that people would be happy to walk down the street seemingly talking to themselves?

Despite promotional videos showing skydiving "Glassers", Google does not recommend using the device while playing sports.

The gadget as a whole is splash-resistant rather than fully waterproof, so it needs protection if you're walking in the rain.

Users I spoke to reported getting between four and six hours of use between charges, rather than the "full day" claimed by Google.

For a first-generation gadget, though, Glass is pretty good, and just like the first fax machine and mobile phone, it will be improved in many ways — including performance and price — and may even reduce in both size and weight so they are barely noticeable.

Until then, Glassers will just have to go about their business looking like Joe 90.

## DO NOT WEAR ...

**In the doctor's surgery or** "where those around don't feel comfortable being photographed or captured on video"

**On the road** "Whether or not any laws limit your use of Glass, always be careful"

**If you've had laser surgery** "Ask your doctor about risks"

**If you're 13 or younger** "Could harm developing vision"

**In demanding situations** "Using Glass while operating heavy equipment or [playing] sports could distract you"

**In heavy rain** "Don't let the Glass device or battery come in contact with liquids"

Source: Google Glass FAQs